

What is claimed is:

CLAIMS

1. An isolated, enriched or purified nucleic acid molecule encoding an ALK-7 polypeptide.

2. The nucleic acid molecule of claim 1, wherein said nucleic acid molecule comprises a nucleotide sequence that

10 (a) encodes a polypeptide having the full length amino acid sequence set forth in SEQ ID NO:2;

(b) is the complement of the nucleotide sequence of (a);

15 (c) hybridizes under highly stringent conditions to the nucleotide molecule of (a) and encodes a naturally occurring ALK-7 polypeptide;

20 (d) encodes an ALK-7 polypeptide having the full length amino acid sequence of the sequence set forth in SEQ ID NO:2, except that it lacks one or more of the following segments of amino acid residues: 1-25, 26-113, 114-493, 137-493, 193-483 of SEQ ID NO:2;

(e) is the complement of the nucleotide sequence of (d);

25 (f) encodes a polypeptide having the amino acid sequence set forth in SEQ ID NO:2 from amino acid residues 1-25, 26-113, 114-493, 137-493, 193-483 of SEQ ID NO:2;

(g) is the complement of the nucleotide sequence of (f);

5 (h) encodes a polypeptide having the full length amino acid sequence set forth in SEQ ID NO:2, except that it lacks one or more of the domains selected from the group consisting of a signal peptide, an extracellular region, a transmembrane domain, a cytoplasmic domain, and a catalytic domain; or

10 (i) is the complement of the nucleotide sequence of (h).

3. The nucleic acid molecule of claim 1, wherein said nucleic acid molecule is isolated, enriched, or purified from a mammal.

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4. The nucleic acid molecule of claim 3, wherein said mammal is a human.

20 5. The nucleic acid molecule of claim 1, further comprising a vector or promoter effective to initiate transcription in a host cell.

6. A nucleic acid probe for the detection of nucleic acid encoding an ALK-7 polypeptide in a sample.

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7. The probe of claim 6 wherein said polypeptide comprises at least 6 contiguous amino acids of the amino acid sequence shown in SEQ ID NO: 2.

5 8. A nucleic acid molecule comprising one or more regions that encode an ALK-7 polypeptide or an ALK-7 domain polypeptide, wherein said ALK-7 polypeptide or said ALK-7 domain polypeptide is fused to a non-ALK-7 polypeptide.

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9. A recombinant cell comprising a nucleic acid molecule encoding either

- (a) an ALK-7 polypeptide;
- (b) an ALK-7 domain polypeptide; or

15 (c) an ALK-7 polypeptide or ALK-7 domain polypeptide fused to a non-ALK-7 polypeptide.

10. An isolated, enriched or purified ALK-7 polypeptide.

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11. The polypeptide of claim 10, wherein said polypeptide is a fragment of the protein encoded by the full length amino acid sequence set forth in SEQ ID NO:2.

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12. The polypeptide of claim 10, wherein said polypeptide comprises an amino acid sequence having

(a) the full length amino acid sequence set forth in SEQ ID NO:2;

5 (b) the full length amino acid sequence of the sequence set forth in SEQ ID NO:2, except that it lacks one or more of the following segments of amino acid residues: 1-25, 26-113, 114-493, 137-493, 193-483 of SEQ ID NO:2;

10 (c) the amino acid sequence set forth in SEQ ID NO:2 from amino acid residues 1-25, 26-113, 114-493, 137-493, 193-483 of SEQ ID NO:2; or

15 (d) the full length amino acid sequence set forth in SEQ ID NO:2 except that it lacks one or more of the domains selected from the group consisting of a signal peptide, an extracellular region, a transmembrane domain, a cytoplasmic domain, and a catalytic domain.

20 13. An antibody or antibody fragment having specific binding affinity to an ALK-7 polypeptide or an ALK-7 domain polypeptide.

14. A hybridoma which produces an antibody having specific binding affinity to a ALK-7 polypeptide.

25 15. A method for identifying a substance capable of modulating ALK-7 activity comprising the steps of:

(a) contacting an ALK-7 polypeptide with a test substance, and  
(b) determining whether said substance alters the activity of said polypeptide.

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16. A method for identifying a substance capable of modulating ALK-7 activity in a cell comprising the steps of:

(a) expressing an ALK-7 polypeptide in a cell,  
10 (b) adding a test substance to said cells, and  
(c) monitoring a change in cell phenotype, cell proliferation, cell differentiation, ALK-7 catalytic activity, or the interaction between an ALK-7 polypeptide and a natural binding partner.

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17. A method of preventing or treating an abnormal condition by administering to a patient in need of such treatment a compound that modulates the function of an ALK-7 polypeptide.

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18. The method of claim 17, wherein said abnormal condition involves an abnormality in ALK-7 signal transduction pathway.

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19. The method of claim 18, wherein said abnormal condition is cancer.

20. The method of claim 17, wherein said compound modulates the function of an ALK-7 polypeptide *in vitro*.

5 21. A kit, comprising the compound of claim 17 and a protocol for the use of said compound.

22. The kit of claim 21, wherein said protocol is approved by the Food and Drug Administration.